UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,459	03/29/2001	Richard Louis Arndt	AUS920010142US1	5645

7590 07/22/2004

Duke W. Yee
Carstens, Yee & Cahoon, LLP
P.O. Box 802334
Dallas, TX 75380

EXAMINER	
CHU, GABRIEL L	

ART UNIT	PAPER NUMBER
2114	

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/820,459	ARNDT ET AL.	
	Examiner	Art Unit	
	Gabriel L. Chu	2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,7,9-17,19,20,22-28,30,31 and 33-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,9-17,19,20,22-28,30,31 and 33-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, 9, 12, 14, 16, 17, 22, 25, 27, 28, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6574755 to Seon in further view of US 5379414 to Adams. Referring to claims 1, 14, and 25, Seon discloses responsive to detecting a recovery attempt from an error for an operation involving a hardware component, storing an indication of the attempt (From the abstract, " If the fault occurs on the SCSI bus while the SCSI command is transferred to the target device, the initiator device retries the transfer of the SCSI command to the target device a predetermined number of times."); and responsive to the error exceeding a threshold, placing the hardware component in a permanently unavailable state (From figure 3, element 305. Wherein Seon, at least, places a hardware component in a "permanently" unavailable state by performing a SCSI bus and/or MPU reset.). Although Seon does not specifically disclose the detecting step occurs in a device driver and placing step occurs in a firmware, using a device driver to respond to errors is known in the art and performing operations using firmware is notoriously well known in the art. From the abstract of Adams, "A system and method which provides a complete

software implementation of a device driver that is capable of detecting an undetectable data corruption problem without hardware redesign and/or internal modification to an existing FDC." A person of ordinary skill in the art at the time of the invention would have been motivated to detect an error with a driver because, from the field of invention from Adams, "eliminates the need for hardware redesign and/or fabrication of new FDCs". Further, Examiner takes official notice for the use of firmware to implement system functionality. An example of this is a BIOS (basic input/output system). A person of ordinary skill in the art at the time of the invention would have been motivated to use a BIOS because it is responsible for basic input and output functionality, provides an interface between the operating system and system hardware, and supports peripheral technologies and internal services.

Referring to claims 3, 16, and 27, Seon discloses the placing step comprises: making a call to a hardware interface layer to place the hardware component into a permanent reset state (From figure 3, element 307. Wherein a permanent reset state is an escalated reset state.).

Referring to claims 4, 17, and 28, Seon discloses the indication is stored in an error log (From figure 3, element 304, wherein the number of retry times is stored).

Referring to claims 9, 22, and 33, Seon discloses the threshold is the error successively a selected number of times (From figure 3, element 304.).

Referring to claim 12, Seon discloses a bus system, a communications unit connected to the bus system, a memory connected to the bus system,

wherein the memory includes a set of instructions, and a processing unit connected to the bus system, wherein the processing unit executes the set of instructions (See figure 2) to store an indication of a recovery attempt from an error in response to detecting the recovery attempt (From the abstract, " If the fault occurs on the SCSI bus while the SCSI command is transferred to the target device, the initiator device retries the transfer of the SCSI command to the target device a predetermined number of times."); and place the hardware component in a permanently unavailable state in response to the error exceeding a threshold (From figure 3, element 305. Wherein Seon, at least, places a hardware component in a "permanently" unavailable state by performing a SCSI bus and/or MPU reset.).

3. Claims 1, 3, 4, 9-14, 16, 17, 22-25, 27, 28, 33, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6711702 to Oberhauser in further view of US 5379414 to Adams. Referring to claims 1, 14, and 25, Oberhauser discloses responsive to detecting a recovery attempt from an error for an operation involving a hardware component, storing an indication of the attempt; and responsive to the error exceeding a threshold, placing the hardware component in a permanently unavailable state (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure. During a locked phase, the peripheral unit that is affected is temporarily taken out of service. After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out. If the unit is determined to be free from faults, a final start-up takes place following the

monitoring phase. In the case of a fault during the monitoring phase, the count of the repetition counter is compared with a threshold value. A final taking-out-of-service takes place if the count of the repetition counter exceeds the threshold value."). Although Oberhauser does not specifically disclose the detecting step occurs in a device driver and placing step occurs in a firmware, using a device driver to respond to errors is known in the art and performing operations using firmware is notoriously well known in the art. From the abstract of Adams, "A system and method which provides a complete software implementation of a device driver that is capable of detecting an undetectable data corruption problem without hardware redesign and/or internal modification to an existing FDC." A person of ordinary skill in the art at the time of the invention would have been motivated to detect an error with a driver because, from the field of invention from Adams, "eliminates the need for hardware redesign and/or fabrication of new FDCs". Further, Examiner takes official notice for the use of firmware to implement system functionality. An example of this is a BIOS (basic input/output system). A person of ordinary skill in the art at thet ime of the invention would have been motivated to use a BIOS because it is responsible for basic input and output functionality, provides an interface between the operating system and system hardware, and supports peripheral technologies and internal services.

Referring to claims 3, 16, and 27, Oberhauser discloses the placing step comprises: making a call to a hardware interface layer to place the hardware component into a permanent reset state (From line 39 of column 3, "If the result

is negative, a final decommissioning OFF_SERV takes place.").

Referring to claims 4, 17, and 28, Oberhauser discloses the indication is stored in an error log (From line 1 of column 4, "During the monitoring phase STAB, a permanent check is made as to whether the peripheral unit to be taken back into service is in a ready state RDY. If this is not so, the monitoring phase STAB is aborted. After that, a check must be made as to whether a threshold value m.sub.max for the maximum number of restart attempts has already been exceeded. If this is so, the peripheral unit is finally taken out of service. Otherwise, the value m of the repetition counter CNT is incremented and a new locked phase LOCK is started.").

Referring to claims 9, 22, and 33, Oberhauser discloses the threshold is the error successively a selected number of times (From line 1 of column 4, "During the monitoring phase STAB, a permanent check is made as to whether the peripheral unit to be taken back into service is in a ready state RDY. If this is not so, the monitoring phase STAB is aborted. After that, a check must be made as to whether a threshold value m.sub.max for the maximum number of restart attempts has already been exceeded. If this is so, the peripheral unit is finally taken out of service. Otherwise, the value m of the repetition counter CNT is incremented and a new locked phase LOCK is started.").

Referring to claims 10, 23, and 34, Oberhauser discloses a method in a data processing system for handling errors, the method comprising: responsive to an occurrence of an error, determining whether the error is a recoverable error (From the abstract, "A repetition counter for counting a number of start-up

attempts is provided for a restarting procedure. During a locked phase, the peripheral unit that is affected is temporarily taken out of service. After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out. If the unit is determined to be free from faults, a final start-up takes place following the monitoring phase. In the case of a fault during the monitoring phase, the count of the repetition counter is compared with a threshold value."); responsive to a determination that the error is a recoverable error, identifying at least one slot on a bus indicating an error state (From the abstract, "After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out." Further, from line 23 of column 2, "In accordance with an additional feature of the invention, a plurality of peripheral units are allocated the following hierarchy levels: a) line unit; b) assembly; c) circuit; d) terminal."); incrementing an error counter for said identified at least one identified slot (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure."); and responsive to the error counter exceeding a threshold, placing said at least one slot into an unavailable state (From the abstract, "A final taking-out-of-service takes place if the count of the repetition counter exceeds the threshold value.").

Referring to claims 11, 24, and 35, Oberhauser discloses responsive to the error counter failing to exceed the threshold, placing said at least one slot into an available state, wherein a device within said at least one slot resumes functioning (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure. During a locked phase,

the peripheral unit that is affected is temporarily taken out of service. After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out. If the unit is determined to be free from faults, a final start-up takes place following the monitoring phase.").

Referring to claim 12, Oberhauser discloses a bus system, a communications unit connected to the bus system, a memory connected to the bus system, wherein the memory includes a set of instructions, and a processing unit connected to the bus system, wherein the processing unit executes the set of instructions to store an indication of a recovery attempt from an error in response to detecting the recovery attempt; and place the hardware component in a permanently unavailable state in response to the error exceeding a threshold (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure. During a locked phase, the peripheral unit that is affected is temporarily taken out of service. After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out. If the unit is determined to be free from faults, a final start-up takes place following the monitoring phase. In the case of a fault during the monitoring phase, the count of the repetition counter is compared with a threshold value. A final taking-out-of-service takes place if the count of the repetition counter exceeds the threshold value.").

Referring to claim 13, Oberhauser discloses a data processing system comprising: a bus system; a communications unit connected to the bus system; a memory connected to the bus system, wherein the memory includes a set of

instructions; and a processing unit connected to the bus system, wherein the processing unit executes the set of instructions to determine whether the error is a recoverable error in response to an occurrence of an error (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure. During a locked phase, the peripheral unit that is affected is temporarily taken out of service. After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out. If the unit is determined to be free from faults, a final start-up takes place following the monitoring phase. In the case of a fault during the monitoring phase, the count of the repetition counter is compared with a threshold value."); identify at least one slot on the bus indicating an error state in response to a determination that the error is a recoverable error (From the abstract, "After that, a monitoring phase with a temporary start-up is initiated during which tests for faults are carried out." Further, from line 23 of column 2, "In accordance with an additional feature of the invention, a plurality of peripheral units are allocated the following hierarchy levels: a) line unit; b) assembly; c) circuit; d) terminal."); increment an error counter for said at least one identified slot (From the abstract, "A repetition counter for counting a number of start-up attempts is provided for a restarting procedure."); and place said at least one slot into an unavailable state in response to the error counter exceeding a threshold (From the abstract, "A final taking-out-of-service takes place if the count of the repetition counter exceeds the threshold value.").

4. Claims 2, 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6574755 to Seon in view of US 5379414 to Adams as applied to claims 1, 14, and 25 above, and further in view of US 6591324 to Chen et al. Referring to claims 2, 15, and 26, although Seon does not specifically disclose clearing the unavailable state of the hardware component in response to a hot-plug action replacing the hardware component, replacing faulty components through hot swapping is well known in the art. An example of this is shown by Chen et al., from line 33 of column 3, "Various types of hot swappable add-on cards plug into the add-on-card slots 104, such as I/O cards 106 to communicate with external devices (like modems), SCSI cards 108 to communicate with SCSI devices (like hard disks), or network cards 110 to establish network communications with other devices." A person of ordinary skill in the art at the time of the invention would have been motivated to hot swap a card because, from line 49 of column 1, "Such techniques enable an add-on card to be swapped from the bus without powering down the computing device."

5. Claims 2, 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6711702 to Oberhauser in view of US 5379414 to Adams as applied to claims 1, 14, and 25 above, and further in view of US 6591324 to Chen et al. Referring to claims 2, 15, and 26, although Oberhauser does not specifically disclose clearing the unavailable state of the hardware component in response to a hot-plug action replacing the hardware component, replacing faulty components through hot swapping is well known in the art. An example of this is shown by Chen et al., from line 33 of column 3, "Various types of hot swappable

add-on cards plug into the add-on-card slots 104, such as I/O cards 106 to communicate with external devices (like modems), SCSI cards 108 to communicate with SCSI devices (like hard disks), or network cards 110 to establish network communications with other devices." A person of ordinary skill in the art at the time of the invention would have been motivated to hot swap a card because, from line 49 of column 1, "Such techniques enable an add-on card to be swapped from the bus without powering down the computing device."

6. Claims are 3, 6, 7, 16, 19, 20, 27, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6574755 to Seon in view of US 5379414 to Adams as applied to claims 1, 14, and 25 above. Referring to claims 3, 16, and 27, Seon discloses the placing step comprises: making a call to a hardware interface layer to place the hardware component into a reset state (From figure 3, element 305). Although Seon does not specifically disclose this reset state can be a "permanent reset", wherein such a reset is interpreted as an indefinite unavailability, making a faulty device indefinitely unavailable, e.g., removing it from service, is notoriously well known in the art. Examiner takes official notice for taking a component out of service. An example of this is turning a component off or removing a hardware device from a device profile. A person of ordinary skill in the art at the time of the invention would have been motivated to take a device out of service because it is, non-exhaustively, irreparable, unusable, not needed, or in preparation for removal or replacement.

Referring to claims 6, 19, and 30, Seon discloses a typical system structure in figure 2 for a processor (11) communicatively connected to SCSI

card (13) through a bus structure. Further, from line 8 of column 4, "When the first MPU 10 sends a specific SCSI command to the hard disk 41 over the SCSI bus 51, the first MPU 10 becomes an initiator device for requesting a SCSI device (or target device) to perform input/output processes, and the hard disk 41, for example, becomes the target device for performing the input/output processes requested by the initiator device." Although Seon does not specifically disclose the error is an error caused by a PCI bus operation, the operation of a SCSI bus on top of a PCI bus is notoriously well known in the art. Examiner takes official notice for a PCI SCSI card. A person of ordinary skill in the art at the time of the invention would have been motivated to use a PCI SCSI card because PCI busses are extremely common in computer systems and the user desires the use of a SCSI compliant device.

Referring to claims 7, 20, and 31, although Seon does not specifically disclose the detecting and placing steps occur in a firmware layer within the data processing system, performing operations using firmware is notoriously well known in the art. Examiner takes official notice for performing actions using firmware. An example of this is a BIOS (basic input/output system). A person of ordinary skill in the art at the time of the invention would have been motivated to use a BIOS because it is responsible for basic input and output functionality, provides an interface between the operating system and system hardware, and supports peripheral technologies and internal services.

7. Claims are 6, 7, 19, 20, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6711702 to Oberhauser as applied to claims 1, 14,

and 25 above. Referring to claims 6, 19, and 30, although Oberhauser does not specifically disclose the error is an error caused by a PCI bus operation, the use of PCI buses, and error caused therefrom, is notoriously well known in the art. Examiner takes official notice for PCI bus errors. A person of ordinary skill in the art at the time of the invention would have been motivated to apply a method for dealing with peripheral units reported as defective to a system with a PCI bus because peripheral units attached to a PCI bus are also prone to error.

Referring to claims 7, 20, and 31, although Oberhauser does not specifically disclose the detecting and placing steps occur in a firmware layer within the data processing system, performing operations using firmware is notoriously well known in the art. Examiner takes official notice for performing actions using firmware. An example of this is a BIOS (basic input/output system). A person of ordinary skill in the art at the time of the invention would have been motivated to use a BIOS because it is responsible for basic input and output functionality, provides an interface between the operating system and system hardware, and supports peripheral technologies and internal services.

Response to Arguments

8. Applicant's arguments with respect to claims 1-4, 6, 7, 9-17, 19, 20, 22-28, 30, 31, and 33-35 have been considered but are moot in view of the new ground(s) of rejection.

Response to Amendment

9. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5644470 to Benedict et al. From line 47 of column 11, "Also device drivers 201 are installed on CPU 2, and may be included in operating system 200. These device drivers 201 are used to control the various components, including the feature cards 5 in slots 106, of the computer system. Device drivers 201 performs such functions and communications, error detection and correction, and the like, I/O host bridge chip 113 is connected to system bus 100 and also to I/O bus 102."

JP409319692A to Miyake. From the solution, "The virtual device driver 11 is a device driver registered inside a main body 1 of the system and has a function for detecting the fault in the operation of input/output to the peripheral device and a function for switching the control route."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gabriel L. Chu whose telephone number is (703) 308-7298. The examiner can normally be reached on weekdays between 8:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel, Jr. can be reached on (703) 305-

9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gc

ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100